higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

FOUNDRY THEORY N1

(11020221)

12 April 2021 (X-paper)
09:00–12:00

This question paper consists of 7 pages.

132Q1A2112

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
FOUNDRY THEORY N1
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Start each section on a new page.
5. Use only a black or blue pen.
6. Write neatly and legibly.

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QUESTION 1

What is a *tuyère*? **[2]**

QUESTION 2

Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (2.1–2.10) in the ANSWER BOOK.

2.1 Which of the following is the correct definition of elasticity?

A Ability to withstand sudden shock loading without fracture.
B Ability to withstand abrasive wear and indentation.
C Ability to be drawn or stretched.
D Ability to return to its original shape after the deforming force has been removed.

2.2 A screw thread is described as M6 x 1.0.

What does the M stand for?

A Metric
B Millimetres
C Metres
D Measurement

2.3 50 000 stainless steel ice-cream tubs are required.

Which one of the following processes is the best for the manufacturing of the tubs?

A Casting
B Vacuum forming
C Extrusion
D Laminating

2.4 Hardness is defined as the ability to …

A withstand sudden shock loading without fracture.
B withstand abrasive wear and indentation.
C be drawn or stretched.
D return to its original shape after the deforming force has been removed.

2.5 Which of the following is not a property of mild steel?

A Magnetic
B Malleable
C Tough
D Plasticity

2.6 Which one is not used for patterns?

A Wood
B Metal
C Polystyrene
D Glass

2.7 Which sand helps with chilling?

A Silica
B Bentonite
C Chrome
D Zircon

2.8 True or False? An induction furnace works with coke.

A True
B False

2.9 True or False? P.P.E is not required for the work place.

A True
B False

2.10 True or False? Safety at the workplace is the employer's responsibility alone.

A True
B False

(10 × 1) **[10]**

QUESTION 3

Give the definition of the following:

3.1 Drag and cope (2)

3.2 Hot-lip pouring (3)

3.3 Core (2)

3.4 Runner system (3)

3.5 Split line (2)

3.6 Loose piece (2)

3.7 L.O.I. (2)

3.8 AFS (2)

[18]

QUESTION 4

Explain the following drawings.

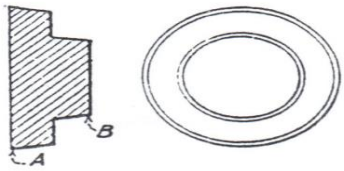

FIGURE 1: FACE PLATE PATTERN



FIGURE 2: PATTERN AND DRAG PLACED ON MOULDING BOARD

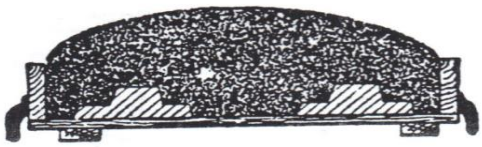

FIGURE 3: DRAG FILLED HEAPING FULL OF MOULDING SAND

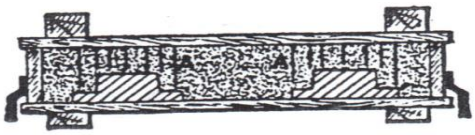

FIGURE 4: FACE PLATE DRAG RAMMED



FIGURE 5: FACE PLATE DRAG READY FOR THE COPE

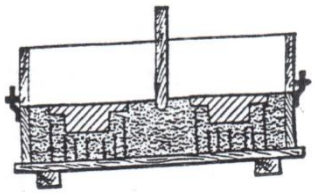

FIGURE 6: COPE AND SPRUE SET IN MAKING FACE PLATE MOULD

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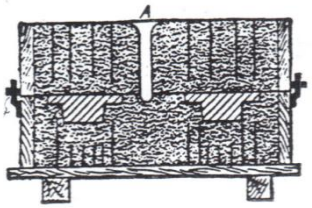

FIGURE 7: FACE PLATE MOULD RAMMED READY FOR COPE TO BE LIFTED

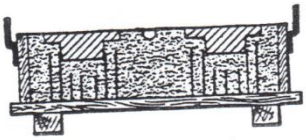

FIGURE 8: DRAG OF FACE PLATE MOULD AFTER COPE HAS BEEN LIFTED OFF



FIGURE 9: COPE OF THE FACE PLATE MOULD LIFTED FROM THE DRAG

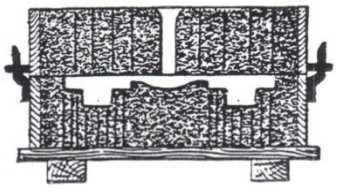

FIGURE 10: FACE PLATE MOULD CLOSED

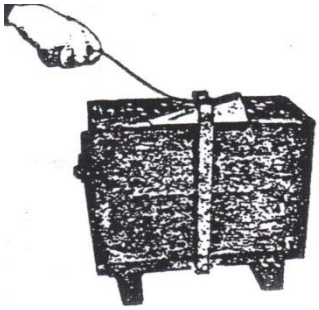

FIGURE 11: CLAMPING FACE PLATE MOULD

[10]

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QUESTION 5

Define the following:

5.1	Green sand	(2)
5.2	Dry sand	(2)
5.3	Facing sand	(2)
5.4	Synthetic sand	(2)
5.5	Green bond	(3)
5.6	Dry bond	(3)
5.7	Permeability	(3)
5.8	Refractoriness	(3)

[20]

QUESTION 6

6.1	Make a neat, labelled drawing of a simple gating system.	(10)
6.2	Provide the rules about gating.	(10)

[20]

QUESTION 7

7.1	What methods are used to inspect castings for defects?	(4)
7.2	Give reasons why castings crack.	(4)
7.3	What causes rough surfaces on castings?	(2)
7.4	How can shrink holes in castings be prevented?	(4)
7.5	What is meant by a *swelled casting* and how can it be prevented?	(6)

[20]

TOTAL: 100

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